

Impact Assessment of Africa RISING: Approaches and Challenges

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Outline

- Do we need impact assessment (IA)—for a project? When (for which year's activities)?
- What are the feasible IA approaches, given the scale/nature/timing of activities? Feasible approach determined by what can be *delivered* by
 - The researchers, with input from IFPRI
 - IFPRI, with input from the researchers

Do we need impact assessment? For which activities?

- Yes, for this year (and the coming years)
 - Need to discuss/agree about the IA approach **now** (survey design is not independent of IA approach)
 - Randomized Controlled Trials (RCTs)
 - Quasi-experimental approaches
 - Farming system modeling
 - Qualitative analyses
 - If a combination, which combination?
 - Other
- Yes, but may be later on?
 - Survey now to meet immediate data needs/RO1
 - Analyze diffusion of technologies now and IA later on (Ethiopia)

What are the feasible IE approaches...?

I. Randomized Controlled Trials (RCTs)

- ❖ Enough sample size - to identify impact when in fact *there is* one
 - Sampling strategy – simple versus clustered sampling
 - Expected change in outcome variable - production per hectare
 - Intra-cluster correlation
 - Inter-temporal correlation
 - Desired statistical significance and power

What are the feasible IE approaches...RCTs?

- Enough sample size/scale of intervention – Ghana (UE, UW, N regions)
Follow-up scenarios -> 20% increase in avg. maize harvest value/area

	New maize harvest/ha	Correlation between measurements	Power	ρ	Sample required (N)	# of households/village	# of villages
Baseline values Avg maize harvest value/ha: 192 GHc/ha Std. dev.: 401 Deff: 3.41 ($\rho=.172$)	230	0.7	90%	-	1,125	-	-
				0.172	2,867	10	287
				0.1	2,138	10	214
				0.05	1,632	10	163
				0.03	1,429	10	143
			80%	-	812	-	-
				0.172	2,070	10	207
				0.1	1,543	10	154
				0.05	1,178	10	118
				0.03	1,032	10	103
				0.172	3,467	20	173
				0.1	2,355	20	118
				0.05	1,584	20	79
				0.03	1,275	20	64

- Large # of HHs per community vs. large # of communities w/ small # of farmers per community

What are the feasible IE approaches...RCTs?

- Enough sample size/scale of intervention – Tanzania (Babati, Kongwa, and Kiteto)

Follow-up scenarios -> 10% increase in avg. maize yield

	New maize yield	Correlation between measurements	Power	ρ	Sample required (N)	# of households/village	# of villages
Baseline values: Avg maize yield: 1660kg/ha Std. dev.: 1311 Deff: 4.28 ($\rho=.234$)	1826	0.7	90%	-	642	-	-
				0.234	1,995	10	200
				0.1	1,220	10	122
				0.05	931	10	93
				0.03	816	10	82
			80%	-	464	-	-
				0.234	1442	10	144
				0.1	882	10	88
				0.05	673	10	67
				0.03	590	10	59
				0.234	2,527	20	126
				0.1	1,346	20	67
				0.05	905	20	45
				0.03	729	20	36

What are the feasible IE approaches...RCTs?

- Enough sample size/scale of intervention – Ethiopia (4 regions)
Follow-up scenarios -> 10% increase in avg. wheat yield

	New wheat yield	Correlation b/n measurements	Power	ρ	Sample required (N)	# of households/village	# of villages
Baseline values: Avg wheat yield: 1171 kg/ha Std. dev.: 554 Deff: 14.15 ($\rho=.453$)	1288	0.7	90%	-	230	-	-
				0.453	1,169	10	117
				0.1	437	10	44
				0.05	334	10	33
				0.03	293	10	29
			80%	-	166	-	-
				0.453	844	10	84
				0.1	316	10	32
				0.05	241	10	24
				0.03	211	10	21
				0.453	1,596	20	80
				0.1	482	20	24
				0.05	324	20	16
				0.03	261	20	13

What are the feasible IE approaches...RCTs?

- Enough sample size/scale of intervention – Malawi (Dedza and Ntcheu)

Follow-up scenarios -> 20% increase in avg. maize yield

	New maize yield	Correlation between measurements	Power	ρ	Sample required (N)	# of households/village	# of villages
Baseline values: Avg maize yield: 1049kg/ha Std. dev.: 1955 Deff: 2.36 ($\rho=.072$)	1259	0.7	90%	-	893	-	-
				0.072	1,469	10	147
				0.1	1,697	10	170
				0.05	1,295	10	130
				0.03	1,135	10	114
			80%	-	645	-	-
				0.072	1061	10	106
				0.1	1226	10	123
				0.05	936	10	94
				0.03	820	10	82
				0.072	1,523	20	76
				0.1	1,871	20	94
				0.05	1,258	20	63
				0.03	1,013	20	51

What are the feasible IE approaches...RCTs?

❖ Random selection

- Of target and control communities (from dev't domains)
- Of the *timing* of interventions in *target* communities – ***phased-in RCT***

Community	Project Year/ Treatment Status		
	Time=t	Time=t+1	Time=t+2
Group 1 (T1)	treated	treated	treated
Group 2 (T2)	control	treated	treated
Group 3 (T3)	control	control	treated
Group 4 (T4)	Control	control	control

What are the feasible IE approaches...RCTs?

❖ Random selection

- Of farmers
 - researchers provides IFPRI a targeting strategy --by community
 - IFPRI prepares a household list of target population (~sampling frame)
 - researchers/IFPRI randomizes farmers to target & control

❖ Baseline survey - LSMS-type

Country	Fielding Date	Survey Duration	Time of data availability
Northern Ghana	March/April, 2013	One month	June/July, 2013
Mali	TBD	TBD	TBD
Tanzania	June/July, 2013	One month	September/October
Malawi	Summer, 2013	One month	TBD
Ethiopia	October/November, 2013	One month	January/February, 2014

What are the feasible IE approaches...RCTs?

- Challenges with RCT
 - Contamination (undesirable)
 - Improper environmental control – controls ‘learning’ from treatments, can be minimized but not avoided
 - Delivery of treatment – “the implementation *is* the intervention” – can be minimized
 - IF *measured*, it can be accounted for during data analyses
 - Spillovers (desirable)
 - Different ways of measuring it
 - Using within-cluster units that remained untreated (Duflo and Saez, 2003)
 - Intersecting an RCT with pre-existing networks (Oster and Thornton, 2009)

What are the feasible IE approaches...?

II. Quasi-experimental approach. For example,

❖ Matching if

- We can identify communities that are ‘similar’ to target communities
- We can collect basic socio-economic data (not LSMS-type) pre-intervention
- We can collect detailed LSMS-type post-intervention data

❖ Regression discontinuity if

- Participation is a deterministic but discontinuous function of some observable characteristic (such as poverty index and land holding...RO1?)
- We have enough households “just above” and “just below” the threshold level
- We can collect detailed LSMS-type post-intervention data

What are the feasible IE approaches...?

III. Farming systems modeling

- researchers will lead the effort and IFPRI will provide support (no in-house expertise)

IV. Qualitative approach

- Need clarity on purpose
- An on-going effort

V. A combination – which combination?

- RCT and farming system modeling
- Farming system modeling and qualitative analysis *now* (to inform AR activities and RCT later)
- Other combination

Summary

- Is there a need for empirical evidence on the causal impact of AR activities – by project?
- Assess and determine the approach(s) feasible, given the scale and timing of activities
- Determine the kind of data to be collected (at baseline) and from whom data will be collected
- Ensure the existence of a system on the ground (personnel, equipment, etc.) before embarking on quality (LSMS-type) data collection (university students?)
- IFPRI will conduct quantitative data collection (when the above are fulfilled) and supports qualitative data collection (ongoing)
- Need for documentation of what has been discussed and agreed